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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
ARENA, ANDREW OWENS	
ART UNIT	PAPER NUMBER
2811	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/789,485	STOLZE, THILO	
	Examiner	Art Unit	
	Andrew O. Arena	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 February 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,8,9 and 11-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,8,9 and 11-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-3, 8, 9, 13-17 and 19-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Fromme (EP 1 083 599).

Regarding Fromme, the English-Language section "novelty" is relied upon.

Re claim 1, Fromme discloses (Fig 3) a power semiconductor module (ln 1) comprising a plurality of semiconductor components (21) situated on substrate regions, wherein:

each substrate region (20) has a top surface and side faces, wherein side faces of two adjacent substrate regions face each other; and

between each two adjacent substrate regions a connecting element (31) is arranged such that the connecting element is adjoining (broadest reasonable interpretation as per MPEP § 2111 encompasses indirect contact) the side faces of the two adjacent substrates, wherein said connecting elements are designed to prevent a deformation of one substrate region to continue to an adjacent substrate region (Fromme discloses claimed structure, capable of claimed function, see MPEP § 2114).

Re claim 2, Fromme discloses (Fig 3) the connecting regions are formed by recesses (between circular portions of 31) in a module housing (32) enclosing said substrate portions.

Re claim 3, Fromme discloses (Fig 3) the material recesses are slotted (recess between circular portions of 31).

Re claims 8, 9 & 12, Fromme discloses (Fig 3) the module housing, at least in the regions of the substrate regions, is such that it acts on the substrate regions with a spring force (solids have inherent elastic modulus, and exert a spring force upon contact).

Re claim 13, Fromme discloses (Fig 3) the power semiconductor module has a housing (32), which, in an area between the substrate regions, has action points for a mechanical pressure application of the connecting regions (any point between substrate regions can be regarded as an action point for a mechanical pressure application), and

the housing applies pressure to the individual substrate regions (In 5-6).

Re claim 14, Fromme discloses (Fig 3) a power semiconductor module (In 1) comprising

a plurality of substrate elements (20) having a top and bottom surface and sidewalls, each substrate element comprising a semiconductor component (21) arranged on the top surface of a substrate element;

one or a plurality of connecting regions (31) arranged adjoining (broadest reasonable interpretation as per MPEP § 2111 encompasses indirect contact) opposing sidewalls of two adjacent substrate elements, wherein said connecting elements are designed to prevent a deformation of one substrate region to continue to an adjacent substrate region (Fromme discloses claimed structure, capable of claimed function, see MPEP § 2114).

Re claim 15, Fromme discloses (Fig 3) a module housing (32) enclosing said plurality of substrate elements.

Re claim 16, Fromme discloses (Fig 3) the connecting elements are formed by recesses (between circular portions of 31) in the module housing.

Re claim 17, Fromme discloses (Fig 3) the material recesses are slotted (recess between circular portions of 31).

Re claim 19, Fromme discloses (Fig 3) the module housing, at least in the regions of the substrate regions, is such that it acts on the substrate regions with a spring force (solids have inherent elastic modulus, and exert a spring force upon contact).

Re claims 20 & 22, Fromme discloses (Fig 3) a heat sink (30) having a fiat (top) surface, wherein a bottom surface of the plurality of substrate elements (20) and said plurality of connecting regions are arranged on said fiat surface.

Re claim 21, Fromme discloses (Fig 3) the module housing (32) in a region between the substrate elements comprises action points for a mechanical pressure application of the connecting elements (any point between substrate regions can be regarded as an action point for a mechanical pressure application), and the housing applies pressure to the individual substrate regions (In 5-6).

Re claim 23, Fromme discloses (Fig 3) a power semiconductor module (In 1) comprising:

a heat sink (30) having a flat (top) surface;

a plurality of substrates (either side of labeled 20) arranged on the fiat surface of the heat sink;

a plurality of semiconductor components (21) arranged on the substrates;

on or a plurality of connecting regions (labeled 20) arranged directly on the fiat surface of the heat sink between adjacent substrate regions, wherein the connecting regions are designed to prevent a deformation of one substrate region to continue to an adjacent substrate region (Fromme discloses claimed structure, capable of claimed function, see MPEP § 2114).

Claim Rejections - 35 USC § 103

Claims 4, 5, 11, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fromme as applied to claims 1, 2, and 14 above, and further in view of Mikio (JP Pub 2001-118987).

Re claims 4, 5 & 18, Fromme differs from the claimed invention only in not expressly disclosing the substrate is a ceramic.

Mikio discloses an analogous device on a ceramic substrate.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made that in Fromme, in view of Mikio, the substrate regions are ceramic; at least for high heat dissipation (JPO machine translation of Mikio: ¶3).

Re claim 11, Fromme discloses (Fig 3) the module housing, at least in the regions of the substrate regions, is such that it acts on the substrate regions with a spring force (solids have inherent elastic modulus, and exerts a spring force on contact).

Response to Arguments

Applicant's arguments filed 02/27/2007 have been fully considered but they are not persuasive.

Arguments regarding claims 1 and 14 that "Fromme shows connecting elements that do not adjoin the side surfaces of the substrate elements" are not convincing. The claims must be given their broadest reasonable interpretation and therefore "adjoining", not having been elsewhere defined, encompasses indirect contact. See MPEP § 2111.

The argument regarding claim 23 that "The examiner cannot use the same element to represent two different limitations of the claim" is merely attorney argument unsupported by evidence or any legal authority. See MPEP § 2145(I). In the present situation, nothing in the claims or specification requires that "connecting regions" are not regions of the recited "plurality of substrates".

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Applicant's claimed "connecting element" can be read onto the encapsulant between chips in any of these cited references.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew O. Arena whose telephone number is 571-272-5976. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard T. Elms can be reached on 571- 272-1869. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Andrew O Arena
14 May 2007

Sara Crane
Primary Examiner